[S07-2] Vertical Structures of Galactic Spiral Shocks

Woong-Tae Kim[1], Eve C. Ostriker[2], & Kim, Chang-Goo[1]
[1]*Seoul National University,* [2]*University of Marylnad*

Spiral arms in disk galaxies are not only sites of active star formation, but also regions where kinetic energy of the ISM is dissipated and regenerated. Their in-plane structures in a razor-thin disk are relatively well understood, yet their vertical configurations and related dynamical processes remain to be addressed. Using numerical MHD simulations, we set up two-dimensional, self-gravitating, magnetized spiral shocks in vertically stratified disks and study their structural evolution. An isothermal equation of state is assumed, and the vertical dependence of spiral stellar potential is neglected. We find that 2D spiral shocks are generally curved and never achieve a steady state, swaying back and forth in the direction parallel to the midplane, which is contrary to in the razor-thin disks where shocks are readily stationary. The amplitude of the associated random velocity field in 2D spiral shocks is estimated to be comparable to the sound speed of the system, suggesting that the interaction of the ISM with a spiral shock may be a substantial source of the ISM turbulence. Time-averaged density structures show that spiral arm regions are thinner than interarm regions by about a factor of two. We discuss physically what drives the flapping motions of the 2D shocks, and also how these shock structures will differ if thermal properties of the ISM are explicitly considered.

[S07-3] The Properties of M33 Star Cluster System

W. -K. Park[1], M. G. Lee[1], H. S. Park[1], S. C. Kim[2]
J. -H. Park[2], S. -G. Lee[1], S. J. Oh[1], Y. -W. Lee[3] Y. -J. Sohn[3]
S. -C. Rey[3], I. -S. Yuk[2], H. -I. Kim[2], W. Han[2]
[1]*Astronomy Program, SEES, Seoul National University*
[2]*Korea Astronomy & Space Science Institute*
[3]*Center for Space Astrophysics, Yonsei University*

We present a study of star cluster system in M33(=NGC 598). More than 1000 star cluster candidates were found from the wide-field BVI CCD images taken with CFHT (Canada-France-Hawaii Telescope). Most of cluster candidates are distributed on the M33 disk, and their B-V colors are less than 0.5, but some of them have colors and magnitudes similar to those of globular clusters in our Galaxy or in M31. Photometric properties as well as other properties of these cluster candidates will be discussed.